



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

## THE MAN OF SCIENCE AFTER THE WAR

By Professor D. FRASER HARRIS, M.D., D.Sc.

DALHOUSIE UNIVERSITY, HALIFAX, N. S.

PROBABLY nothing less than a war such as this could have shaken the British race out of its comfortable mental inertia in regard to all things scientific. The English generally had no interest in science, even though it had conferred on them such extremely convenient adaptations of pure science to the needs of everyday life as the telegraph, the telephone, the electric light and the motor car. Science, however, does seem to be coming into its own. For the first time in the history of the British Empire, this Cinderella amongst the things of the mind is being taken from the kitchen and led to her place on the throne.

Men who have been speaking of war as "applied chemistry" are now considering that it would be a good thing if the treasures of science, so horribly misapplied, could be utilized in the future systematically, openly, advisedly for the beneficent aims of peace. For modern life is begun, continued and ended in science; it is applied science from morning to night, from birth to the grave.

Men are asking themselves: If it was in the power of science to make war so frightful, is it not within her essentially beneficent capabilities to make the coming day of peace fuller, richer and more glorious than ever day in the past has been?

It can not be denied that science as science has only very recently been allowed to have an independent existence in the British, national, intellectual system. The time is within the memory of some of us when the attempt to introduce laboratory teaching into the University of Oxford was met with furious resistance; and when at length studies in practical chemistry were instituted, they were alluded to as "stinks."

History was repeating itself, for Leo Africanus, writing in the early part of the sixteenth century, thus described the chemical society of the learned Arabians at Fez, "there is a most stupid set of men who contaminate themselves with sulphur and other horrible stinks." The attitude of England's premier university was in precisely the same spirit as that of the ex-priest who, on demanding the execution of Lavoiser,

declared that the Republic had no need of chemists. This was in 1794; but fifty years later Oxford made it very clear that she too and all that she stood for in English life had no need of chemists or of any other kind of scientist. This was the traditional, mental attitude of educated Englishmen right up to the mid-Victorian era. The English gentleman knew no science, did not want to know any, and honestly thought that his country did not need to know any. We are all too apt to imagine that what we don't happen to care about is not worth while other people's caring about. The English gentleman certainly seemed to get on very well without science, as his ancestors had done before him; and where were there any gentlemen so perfect as those of English birth? The Englishman spoke, like one of the characters in "Trilby," contemptuously of all foreigners as "damned." He had his ancestral seat and his large rent roll, and his scores of servants, so that he never wanted for daily food, nor needed to soil his hands from one year's end to the other. If he did want a profession for a younger son, were not the Church, the Navy, the Army, the Diplomatic or Civil services all open to him? Everything else, including science, might be left to beastly, eccentric, long-haired "foreigners." In the Navy and Army, whatever else he was, he was brave; but he left any science which those services required to those far beneath him, to those specially paid to bother about "beastly technical details." As regards the practice of medicine, an applied science, he held exactly the same view as the ancient Roman who regarded that occupation quite unworthy of a gentleman. The author remembers well when, in the early nineties, he once filled up a form under the heading "Profession" with the word "physiologist," his father exclaiming, "But that's not a profession!" He was perfectly right from the mid-Victorian standpoint; it was not a profession in the sense that the Church, Fighting or the Law were professions. Where were the ancient privileges, social recognition, pensions or fees for physiologists? There was a day when it was perfectly true that the world had no need of physiologists. I was told the truth when I was once informed that as far as my occupation was concerned with social recognition, I might just as well have been a hangman.

Science had not yet come into her own.

A very great deal of all this has been changed with the inevitable onward march of the army of seekers after truth. Science became less an affair for amateurs and more the concern of serious men. The founding of University College, London,

the instituting of degrees in pure science—B.Sc. and D.Sc.—by the University of London, did a great deal to foster the study of pure science in England and give it academic status. The uprising of the school of biology at Cambridge under Foster and F. M. Balfour was all in the same direction; but in some nostrils at Oxford science still stinks, and—it is no profession.

When one says that the man of science is necessary to the national life, one generally thinks how science underlies our great trades and chemical manufactures and all the activities of our complicated social system, railways, steamships, wireless telegraphy, gunnery, aviation and the untold wonders of to-morrow. But the man of science is as necessary to national welfare in an infinitude of less conspicuous and more familiar ways. There is scientific farming and there is scientific marketing; there is a science of dietetics as surely as there is a science of agriculture.

Science is looking into everything, focusing her light upon everything. When the light of nature fails, then science steps in; she illuminates and directs our paths; she allures "to brighter worlds" and leads the way.

Science, therefore, in the national interests must be encouraged. But there is no such thing as encouraging science in the abstract; it is the men of science, themselves, who have to be encouraged; and encouragement means, to put it brutally, being paid salaries on which they can think and work without financial worry. This is put brutally, but it is not so brutal as the being presented with bills to be paid out of an inadequate income.

The man of science is intended to research, every one will admit; but in whose time and with whose money? We may as well be frank about it. If he is a professor at one of the universities, he probably has all his day filled up with his teaching and administrative duties. In such a day, what time is there for research? He has to teach for a living; his time is not his own, but the governors' of the university. Suppose for a moment that all his day is not occupied with university duties, is it his *duty* to research in the university's time? Most people would reply that it certainly is. But not every professor is appointed with explicit instructions to do research when he is not teaching. He may not be capable of doing any research at all; may never have done any; he may not have been appointed because he could do research, but for some quite other reason. It is a nice point: unless it is definitely understood that the professor is expected to do research, he is using the

university's time for non-university pursuits. For the research in question may not benefit the university at all; it may, conceivably, benefit some other institution, or, inconceivably, the professor himself. But whatever or whoever is benefited, almost all research in universities is done in university time and with university money, so that we shall suppose that there is tacit permission given by the university authorities for such work. It is, however, perfectly possible that the amount of time available when the university teaching duties are done, and the time in the home circle passed, is quite insufficient for the long stretches of work which almost every research demands. You can not follow out any line of work in odd periods of isolated ten minutes, the worker must have hours of uninterrupted work at a stretch. It is precisely this that the teaching professor can not have; either his teaching or his research must suffer.

The only solution is for the universities to acknowledge that they are institutions quite as much for the prosecution of research as for the teaching of young people either the foundations or the heights of science. It should be made quite clear that the members of the staff are fulfilling their university duties quite as faithfully when they research as when they lecture, and that their salaries will not depend on the number of teaching hours per week, but on the cost of living in the particular city in which the university happens to be. Probably the only satisfactory solution of the teaching *versus* research problem is for the universities to recognize teaching professors and research professors, teaching assistants and research assistants. It should, in fact, be acknowledged that it will be regarded as a credit to the university if certain of its professors research rather than teach, as was the case with the late Lord Kelvin. Lord Kelvin's forte was not teaching the elements of physics to junior students who knew no mathematics; yet this was the daily duty actually set before the greatest physicist since Newton. Had Lord Kelvin not shed such great luster on his alma mater by the brilliance of his reputation as an original worker, he would have come within a very little of being put down as a failure. He researched, however, in the university's time; but as far as I know there was nothing in his Lordship's commission about research as a part of his duties.

Both the teaching members and the researching members of the staff should receive such salaries as would make them independent of worry regarding the financial *modus vivendi*. The teaching professor should not have to research in order to

convince himself that only by so doing is he carrying out his entire duty; the researching professor ought not to have to teach in order to obtain a salary to enable him to live.

The importance of the researches done at the Rockefeller Institute of Experimental Medicine is a proof of the great value to science of the endowment of an institution whose staff is not burdened by teaching as the only means to a livelihood. An eccentric Scottish professor once said: "The university would be a fine place if it were not for the students!"

When we touch the subject of salaries, we come to a question likely to evolve more heat than light. Broadly put, it may be said that professors of science subjects are not paid salaries commensurate with their highly specialized attainments, nor such as enable them to live in the style expected of other dwellers on the same social stratum. It is of course quite foreign to the subject to say that they are not paid as highly as all sorts of persons whose mental attainments are inferior. There is no general scheme of paying salaries according to the degree of attainments salaries are paid on the basis of the scarcity in the "market" of the kind of person to receive them. Now since there is no market for professors in the same sense that there is for clerks or day laborers, and since there is always a relatively large number of trained men willing to work for a small salary because they know very well that they can not get a large one, professors are compelled to take quietly what is given them and to ask no questions. This is no new grievance; the smallness of professors' salaries has long been a standing joke in the comic papers. It is indicative of the small regard in which men of science are held. Hitherto their researches have been seized on and commercialized for the benefit of other and more worldly wise individuals. It is this sort of thing which will be changed after the war. The man of science must be recognized as the most important person in the post-bellum community, a person without whom the capitalist would have no discoveries to commercialize.

We should have a Minister of Science, whose duties would be amongst others to see that scientific men were encouraged, subsidized, promoted, rewarded and pensioned. For why should state recognition, encouragement, promotion and rewarding be reserved for sailors, soldiers, diplomatists and lawyers? Why should it be so entirely correct to be paid for legal opinion, and such "bad form" to be remunerated for scientific advice? Because, it may be replied, the law is an ancient, respectable profession, and science is so recent, it is not a profession at all.

This medieval state of affairs can not go on indefinitely; it was all very well for the day when there was no science to foster, but it is out of place in an age which lights its cities by the invisible, speaks to the antipodes without wires, flies in high heaven like the eagle, and descends to the abyss like a sea monster. Much that now falls under the supervision of the Home Secretary could be transferred to the Science Minister. The first concern of the science office would be the place of science in the schools of the Empire, the still burning question of the rival claims of science and the classics. It ought to be perfectly possible to instruct boys in as much of Greek and Latin as would make them know the origin of the words in English derived from those languages, without necessarily making the boys read entire Greek and Latin authors in the original. Through our national physiological momentum we have been educating boys as though they were all going to be teachers of the classics; we have continued on the same educational lines as those laid down by Linacre and Erasmus when America had just been discovered and printing just invented.

The Science Office will see to it that science receives official recognition in all entrance examinations whatsoever, and is not handicapped by receiving fewer marks than the classics or any other subject.

Science must have its place on every curriculum, not on sufferance or by-your-leave, but by right of its inherent dignity and in virtue of its essential usefulness. Why is a knowledge of science so useful to the modern community? Because, apart altogether from the way in which it makes for technical efficiency, it is a means second to none for the training of the intellectual powers. It trains us in accuracy of observation, in the power of drawing trustworthy conclusions, in the habits of precise, critical thinking—and these are not small things.

Science, the true, is the patient, loving interpretation of the world we live in, it is a striving to attain not merely to an understanding of the laws whereby the world is governed, but to the enjoyment of the order and beauty which are everywhere revealed.

Amongst the many unspeakably sad things which this war has brought about, the prostitution of science and the destruction of things beautiful are not the least lamentable, for

Outraged science shudders that her glorious treasures  
Should be so corrupted by the sons of men;  
Beauty's gentle spirit grieves as it grieved never  
For those scenes of Beauty that can not come again!